PROGRAMS FOR GENOMIC APPLICATIONS

National Heart, Lung, and Blood Institutes
National Institutes of Health

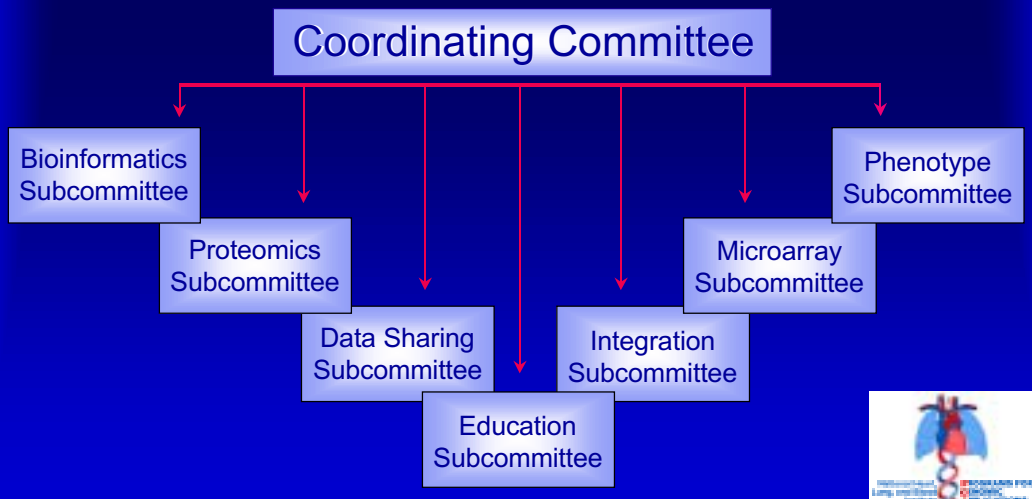
Mission Statement

To develop new resources, reagents, and education programs for investigators engaged in NHLBI-related research.

PGA Mission

- Provide new resources and reagents to link genes to biological function and make these readily available to the NHLBI community.
- Facilitate workshops, courses, and visiting scientist programs to train investigators in the technologies being applied in the PGAs.
- Rapidly disseminate data through the world wide web and public databases.

Organizational Structure



PGA Programs

Applied Genomics in CardioPulmonary Disease
Johns Hopkins University School of Medicine

Genomics of Cardiovascular Development, Adaptation, & Remodeling
Harvard Medical School

Physiogenomics of Stressors in Derived Consomic Rats
Medical College of Wisconsin

Genomics of Proteomics of Cell Injury and Inflammation
University of Texas S.W. Medical Center

Innate Immunity in Heart, Lung, and Blood Diseases
The University of Arizona

UW-FHCRC Variation Discovery Resource
University of Washington

Mouse Models of Heart, Lung, and Blood Diseases
The Jackson Laboratory

Expression Profiling of Rodent Models of Human Disease
The Institute for Genomics Research

Comparative Genomic Analysis of Cardiovascular Genes
Lawrence Berkeley National Laboratory

Genomic Analysis of Stress and Inflammation
Harvard Medical School

NHLBI Bay Area Functional Genomics Consortium
The David J. Gladstone Institute

Subcommittee Chairs

Bioinformatics
- Carol Bult, Ph.D., *The Jackson Laboratory*

Data Sharing
- Isaac Kohane, M.D., Ph.D., *Harvard Medical School*

Education
- Scott Weiss, M.D., M.S., *Harvard Medical School*

Genomic Inventory/Integration
- Edward Rubin, M.D., Ph.D., *The Lawrence Berkeley National Laboratory*

Microarray
- John Quackenbush, Ph.D., *The Institute for Genomics Research*

Phenotype
- Andrew Greene, Ph.D., *Medical College of Wisconsin*

Proteomics
- Thomas Kodadek, Ph.D., *Univ. Texas S.W. Medical Center*

Anticipated PGA Resources/Tools

- Mouse models of HLBS disorders
- Rat models of HLBS disorders
- Microarrays
- DNA Variations (SNPs - locations, allele frequencies, genotypes and haplotypes)
- Reagents (clones, antibodies, mice, and rats)
- Protocols
- Bioinformatic Resources (software tools and databases)

BayGenomics

http://baygenomics.ucsf.edu

Focus: Cardiopulmonary Development and Disease

- Apply custom gene-trap vectors to inactivate genes in ES cells and to evaluate the functional importance of these in cardiopulmonary development and disease using computational approaches, expression profiling, *in situ* hybridization studies, and in select cases in animals.

PI: Dr. Stephen G. Young

CardioGenomics http://www.cardiogenomics.org

Focus: Cardiovascular Development, Adaptation, and Remodeling

- To link genes to function, dysfunction, and structural abnormalities of the cardiovascular system caused by clinically relevant genetic and environmental stimuli.

PI: Dr. Seigo Izumo

HopGenes http://www.hopkins-genomics.org

Focus: Tissue Remodeling in Cardiopulmonary Disease

- To identify the genes involved in tissue remodeling using expression profiling to explore the pathology of asthma, chronic obstructive pulmonary disease, cystic fibrosis, lung transplantation, acute lung injury, scleroderma, sarcoidosis, pulmonary hypertension, ischemic cardiomyopathy, and cardiac transplantation.

PI: Dr. Joe G.N. Garcia

Innate Immunity

http://innateimmunity.net

Focus: Genetics of HLB Disorders

- Explore genetic susceptibility in asthma, chronic obstructive pulmonary disease, myocardial infarction and deep venous thrombosis by evaluating polymorphisms in genes involved in innate immune responses.

PI: Dr. Fernando D. Martinez

JAX PGA

http://pga.jax.org

Focus: Mouse Models of HLBS Disorders

- Apply a phenotype-driven approach to identify the genetic mechanisms underlying the physiology and pathophysiology of atherosclerosis, hypertension, lung function, blood formation, thrombosis, obesity, inflammation, and sleep function.

PI: Dr. Luanne L. Peters

PARABIOSYS

http://genetics.mgh.harvard.edu/Parabiosys/

Focus: Genetics of Inflammation and Stress

- To identify and characterize the gene networks activated by pro-inflammatory, metabolic, and pathogenic stresses affecting cardiovascular and pulmonary systems.

PI: Dr. Brian Seed

Berkeley PGA

http://pga.lbl.gov

Focus: Cardiovascular Gene Expression

- Apply comparative genomics to identify and understand the role of cis-acting regulatory elements that affect the expression of cardiovascular genes.

PI: Dr. Edward M. Rubin

PhysGen

http://pga.mcw.edu

Focus: Rat Models of HLBS Disorders

- Dissect multigenic common HLBS diseases through the development of panels of chromosomal substitution strains of rats (consomic rat panels).

PI: Dr. Howard J. Jacobs

Seattle SNPs

http://pga.mbt.washington.edu

Focus: Inflammation and Genetic Variability

- To identify variable sites in human genes to expand the resources available to explore the role of inter-individual variation and its relationship to disease risk, outcome and treatments for common human disorders.

PI: Dr. Deborah A. Nickerson

Southwestern

http://pga.swmed.edu

Focus: Cell Injury and Inflammation

- Elucidate the basic mechanisms underlying cell injury and inflammation through a combination of genomic and proteomic approaches.

PI: Dr. Stephen A. Johnston

TREX

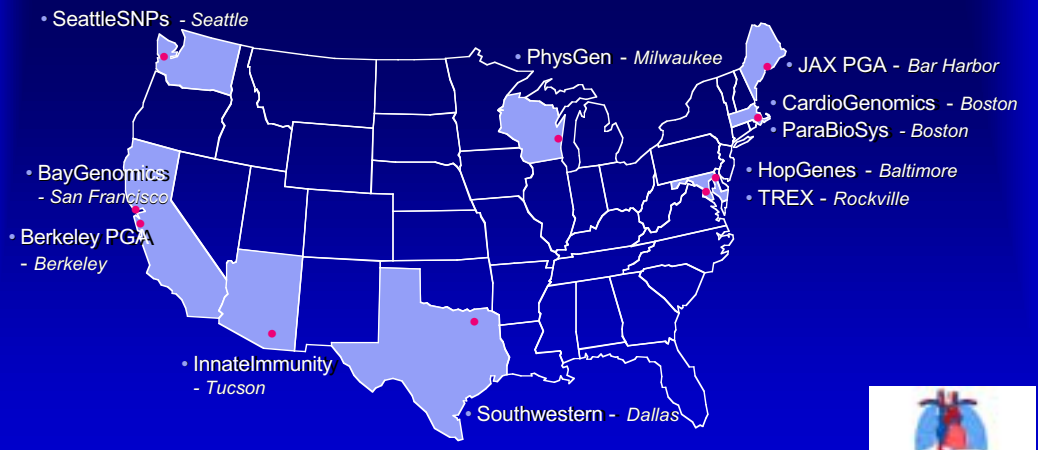
http://pga.tigr.org

Focus: Gene Expression in HLBS Disorders

- Explore gene-environment interactions using rodent models of human disease and cDNA microarray assays to elucidate patterns of gene expression in heart, lung, blood, and sleep disorders.

PI: Dr. John Quackenbush

NHLBI PGA Research Network



NHLBI PGA Web Sites

PROGRAMS FOR GENOMIC APPLICATIONS

http://www.nhlbi.nih.gov/resources/pga/index.htm

PGA Web Sites (cont.)

BayGenomics - http://baygenomics.ucsf.edu

CardioGenomics - http://www.cardiogenomics.org

HopGenes - http://www.hopkins-genomics.org

InnateImmunity - http://innateimmunity.net

JAX PGA - http://pga.jax.org

ParaBioSys - http://genetics.mgh.harvard.edu/Parabiosys/

PGA Web Sites (cont.)

Berkeley PGA - http://pga.lbl.gov

PhysGen - http://pga.mcw.edu

SeattleSNPs - http://pga.mbt.washington.edu

Southwestern - http://pga.swmed.edu

TREX - http://pga.tigr.org